

What is claimed is:

1. A method for capping a Micro-Electromechanical System (MEMS) device,  
the method comprising:

5 forming a cap structure having a bottom side with at least a MEMS cavity,  
a cut capture cavity surrounding the MEMS cavity, and a cap wall, the cap wall  
forming an outer wall of the MEMS cavity and an inner wall of the cut capture  
cavity;

bonding the cap wall onto a MEMS structure; and

10 cutting through to the cut capture cavity from a top side of the cap  
structure to form a cap.

2. The method of claim 1, wherein forming the cap structure comprises:  
forming the MEMS cavity and the cut capture cavity into the bottom side  
15 of the cap structure.

3. The method of claim 2, wherein forming the MEMS cavity and the cut  
capture cavity into the bottom side of the cap structure comprises:  
etching the MEMS cavity and the cut capture cavity into the bottom side  
20 of the cap structure.

4. The method of claim 1, wherein forming the cap structure comprises:  
forming the cap wall onto the bottom side of the cap structure, the cap  
wall forming the outside wall of the MEMS cavity and the inside wall of the cut  
25 capture cavity.

5. The method of claim 4, wherein forming the cap wall onto the bottom side  
of the cap structure comprises:  
depositing a cap wall material onto the bottom side of the cap structure to  
30 form the cap wall.

6. The method of claim 1, wherein bonding the cap wall onto the MEMS structure comprises:

applying a bonding material to a bottom side of the cap wall; and  
bonding the bottom side of the cap wall onto the MEMS structure.

7. The method of claim 6, wherein the bonding material comprises a glass material.

8. The method of claim 7, wherein applying the bonding material to the bottom side of the cap wall comprises:

screen printing a glass frit material onto the bottom side of the cap wall;  
burning off organic compounds of the glass frit material; and  
glazing the remaining glass frit material to form the glass material.

9. The method of claim 7, wherein bonding the bottom side of the cap wall onto the MEMS structure comprises:

bonding the bottom side of the cap wall onto the MEMS structure under pressure at a temperature sufficient to melt the glass material.

10. The method of claim 1, further comprising:

filling the cut capture cavity with a protective material prior to cutting through to the cut capture cavity from the top side of the cap structure to form the cap.

11. The method of claim 10, wherein the protective material comprises a wax material.

12. The method of claim 10, further comprising:

removing residual protective material after cutting through to the cut capture cavity from a top side of the cap structure to form the cap.

13. The method of claim 1, wherein cutting through to the cut capture cavity from the top side of the cap structure to form the cap comprises cutting through to the cut capture cavity from the top side of the cap structure using at least one of:

- a precision cutting technique;
- a precision grinding technique;
- a laser technique; and
- an etching technique.

14. The method of claim 1, wherein the cap structure comprises a silicon material.

15. An apparatus for capping a Micro-Electromechanical System (MEMS) device, the apparatus comprising a bottom side with at least one MEMS cavity, cut capture cavity surrounding the MEMS cavity, and cap wall, the cap wall forming an outer wall of the MEMS cavity and an inner wall of the cut capture cavity.

16. The apparatus of claim 15, wherein the MEMS cavity and cut capture cavity are recessed into the bottom side.

17. The apparatus of claim 15, wherein the cap wall is built upon the bottom side so as to form the outside wall of the MEMS cavity and the inside wall of the cut capture cavity.

18. A capped Micro-Electromechanical System (MEMS) device produced by the process of forming a cap structure having a bottom side with at least a MEMS

cavity, a cut capture cavity surrounding the MEMS cavity, and a cap wall, the cap wall forming an outer wall of the MEMS cavity and an inner wall of the cut capture cavity; bonding the cap wall onto a MEMS structure; and cutting through to the cut capture cavity from a top side of the cap structure to form a

5 cap.

2550-117-174090 (APD2004-1-US)  
10/23/01